Trends and Sustainability of Groundwater in Highly Stressed Aquifers

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Preface

Population growth, urbanization and global climate change have increased urban and agricultural water demands, stressing aquifer systems where groundwater is a source of water supply. The availability and utility of groundwater may further be threatened by factors stressing the quality of groundwater, such as industrial and domestic wastes and agricultural intensification. Consequences include, for example, over-allocation of groundwater, groundwater overdraft, declining well yields and land subsidence; degraded groundwater quality due to mobilization of natural pollutants (arsenic), salt contamination caused by seawater intrusion; increased demand for conjunctively used surface water, and resulting conflicts with junior users; and streamflow capture and resulting damage to ecosystems. These consequences may occur incrementally and inequitably across an aquifer. Natural environmental problems can further complicate use of groundwater and increase strain on the aquifer system; for example, underground structures, geothermal heating (such as heat islands), and geochemical evolution (such as karst formation, excessive salinity, acidity, fluoride, radioactivity, hardness, or turbidity).

To address this issue, a joint symposium on the *Trends and Sustainability of Groundwater in Highly Stressed Aquifers* was held during the 8th Scientific Assembly of the International Association of Hydrological Sciences, IAHS, and the 37th Congress of the International Association of Hydrogeology, IAH, in Hyderabad, India, September 2009. The symposium was organized by the IAHS International Commission on Groundwater (ICGW), supported IAH and by the IAHS International Commission on Water Quality (ICWQ).

This symposium brought together scientists, including modellers, geochemists and hydro-geologists, with water supply managers and policy makers to discuss scientific and management ideas and approaches for improving the sustainability of highly stressed aquifers. The importance of this topic was reflected in the large number of contributions to the symposium. Selected papers from this symposium have been compiled in this volume.

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